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10/769,239	01/31/2004	Wei Zhang	K35R1865	8179

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EXAMINER	
RENNER, CRAIG A	
ART UNIT	PAPER NUMBER
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/769,239	ZHANG ET AL.	
	Examiner	Art Unit	
	Craig A. Renner	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *14-26 and 40-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 27-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *31 January 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 41-54 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 02 August 2006.

2. Applicant's election without traverse of "Invention I, Claims 1-40" and "Species I directed to Figs. 1A and 2A-2F, on which Claims 1-13 and 26-39 can all read" in the reply filed on 08 January 2007 is acknowledged. Claim 26, however, does not read on the elected species as elected Species I directed to Figs. 1A and 2A-2F does not include a "second dusting layer directly below the bias layer", for instance. Non-elected Species III of FIG. 1C includes this feature. Accordingly, claims 14-26, 40, and 55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim.

Drawings

3. The drawings are objected to because of the following informalities:

a. The drawings fail to comply with 37 CFR 1.84(p)(5) because they do not include one or more reference signs mentioned in the description. Note, for instance,

"60" (disclosed as a "dusting layer" twice in line 6 of paragraph [0023] on page 4, for instance).

b. In FIGS. 1A-1C, the placement of spacer layer 25 and pinned layer 26 is switched and should be corrected. In order for a giant magnetoresistive (GMR) sensor to function properly, the spacer layer should be between the pinned and free layers as opposed to being between the pinned and pinning layers. Also note the objection in paragraph 4a, infra.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) and/or an amendment to the specification in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

a. In lines 8-9 of paragraph [0024] on page 5, the placement of spacer layer 25 and pinned layer 26 is switched and should be corrected. In order for a giant

magnetoresistive (GMR) sensor to function properly, should be between the pinned and free layers as opposed to being between the pinned and pinning layers. Also note the objection in paragraph 3b, supra.

b. In line 5 of paragraph [0025] on page 5, and line 3 of claim 30, each instance of "maganese" should be spelled --manganese--.

c. In line 1 of paragraph [0039] on page 9, "transmision" should be spelled --transmission--.

d. In lines 2-3 of claim 34, the repetition of "CoPt" should be deleted for clarity.

Appropriate correction is required.

Claim Objections

5. Claims 30 and 31 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 30 and 31 fail to further limit base claim 28 in the situation where the underlayer material is selected to be "nickel-aluminum alloy", for instance, in base claim 28.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11, 27, 29-32 and 34-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Simion et al. (US 6,185,081).

With respect to claims 1-5, 7-8, 27, 29-32 and 34-39, Simion et al. (US 6,185,081) teaches a magnetoresistive read head (20, for instance) comprising a magnetoresistive sensor (includes 33, for instance); and a bias structure (includes 40, for instance) adjacent to the magnetoresistive sensor, the bias structure providing a magnetostatic bias field for the magnetoresistive sensor, the bias structure comprising an underlayer (37); a bias layer (40) over the underlayer; and at least one dusting layer (35) directly below at least one of the underlayer or the bias layer (as shown in FIG. 5, for instance, i.e., directly below the underlayer) [as per claim 1]; wherein the dusting layer is directly below the underlayer (as shown in FIG. 5, for instance) [as per claim 2]; wherein the dusting layer comprises discontinuous, densely-packed, small islands of material (as shown in FIG. 5, for instance, i.e., two discontinuous, densely-packed,

small islands of material are to the left and right of element 28, for instance) [as per claim 3]; wherein the dusting layer comprises a material having a sufficiently high surface energy and sufficiently low atomic mobility to form the islands (as shown in FIG. 5, for instance) [as per claim 4]; wherein the dusting layer is formed (as shown in FIG. 5, for instance) [as per claim 5]; wherein the dusting layer comprises a material selected from a group consisting of tungsten, tantalum, niobium, rhodium, molybdenum, tungsten-titanium alloy, tungsten-chromium alloy, and nickel-aluminum alloy (line 24 in column 4, for instance, i.e., "NiAl" is nickel-aluminum alloy) [as per claim 7]; wherein the dusting layer comprises platinum or titanium (lines 35-37 in column 3, for instance, i.e., "titanium") [as per claim 8]; wherein the magnetoresistive sensor is selected from a group consisting of a giant magnetoresistive (GMR) sensor, an anisotropic magnetoresistive (AMR) sensor, a tunneling magnetoresistive (TMR) sensor, a spin-dependent-tunneling (SDT) sensor, a spin valve (SV) sensor, a current-in-plane (CIP) sensor, and a current-perpendicular-to-the-plane (CPP) sensor (lines 21-24 in column 1, for instance, i.e., a group consisting of a giant magnetoresistive (GMR) sensor, an anisotropic magnetoresistive (AMR) sensor, and a spin valve (SV) sensor, for instance) [as per claim 27]; wherein the underlayer comprises a material selected from a group consisting of chromium, chromium-containing alloy, tungsten, tungsten-containing alloy, nickel-aluminum alloy, and iron-aluminum alloy (lines 31-32 in column 4, for instance, i.e., a group consisting of chromium and chromium-containing alloy, for instance) [as per claim 29]; wherein the chromium-containing alloy comprises a material selected from a group consisting of titanium, vanadium, molybdenum, manganese, and tungsten

(lines 31-32 in column 4, for instance, i.e., vanadium, for instance) [as per claim 30]; wherein the tungsten-containing alloy comprises a material selected from a group consisting of chromium, titanium, vanadium, and molybdenum (as the claims only set forth a situation when the underlayer material is tungsten-containing alloy, and the present situation does not include tungsten-containing alloy, the material composition of the tungsten-containing alloy has no weight, see also paragraph 5, supra) [as per claim 31]; wherein the underlayer has a thickness in a range from approximately 20 Angstroms to approximately 250 Angstroms (lines 46-47 in column 4, for instance, i.e., "50 Å", for instance, falls within the range from approximately 20 Angstroms to approximately 250 Angstroms) [as per claim 32]; wherein the bias layer comprises a material selected from a group consisting of CoPt, CoCrPt, CoCrPtTa, CoCrPtB, CrPt, and FePt (lines 43-45 in column 4, for instance, i.e., a group consisting of "CoCrPt" and "CoCrPtTa", for instance) [as per claim 34]; wherein the bias layer has a thickness in a range from approximately 75 Angstroms to approximately 300 Angstroms (lines 41-43 in column 4, for instance, i.e., "between about 200 Å and 700 Å", for instance, includes values within the range from approximately 75 Angstroms to approximately 300 Angstroms) [as per claim 35]; wherein the bias layer has a thickness in a range from approximately 100 Angstroms to approximately 250 Angstroms (lines 41-43 in column 4, for instance, i.e., "between about 200 Å and 700 Å", for instance, includes values within the range from approximately 100 Angstroms to approximately 250 Angstroms) [as per claim 36]; wherein the magnetoresistive read head further comprises an electrically conductive lead layer (42) over the bias layer (as shown in FIG. 5, for

instance) [as per claim 37]; wherein the lead layer comprises a material selected from a group consisting of gold, tungsten, rhodium, chromium, and copper (lines 50-53 in column 4, for instance, i.e., "gold", for instance) [as per claim 38]; and wherein the lead layer has a thickness in a range from approximately 100 Angstroms to approximately 1000 Angstroms (lines 50-54 in column 4, for instance, i.e., "500 Å", for instance, falls within the range from approximately 100 Angstroms to approximately 1000 Angstroms) [as per claim 39]. As the claims are directed to a "magnetoresistive read head", per se, the method limitation(s) appearing in line 2 of claim 5 can only be accorded weight to the extent that it affects the structure of the completed magnetoresistive read head. Note that "[d]etermination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process [i.e., "formed by ion-beam deposition", for instance], and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior product was made by a different process", *In re Thorpe, et al.*, 227 USPQ 964 (CAFC 1985). Furthermore, note that a "[p]roduct-by-process claim, although reciting subject matter of claim in terms of how it is made [i.e., "formed by ion-beam deposition", for instance], is still product claim; it is patentability of product claimed and not recited process steps that must be established, in spite of fact that claim may recite only process limitations", *In re Hirao and Sato*, 190 USPQ 685 (CCPA 1976).

With respect to claims 1-2, 6 and 9-11, Simion et al. (US 6,185,081) teaches a magnetoresistive read head (100, for instance) comprising a magnetoresistive sensor (105/108/110/112/115/118/120); and a bias structure (includes 133, for instance)

adjacent to the magnetoresistive sensor, the bias structure providing a magnetostatic bias field for the magnetoresistive sensor, the bias structure comprising an underlayer (127); a bias layer (133) over the underlayer; and at least one dusting layer (125) directly below at least one of the underlayer or the bias layer (as shown in FIG. 8, for instance, i.e., directly below the underlayer) [as per claim 1]; wherein the dusting layer is directly below the underlayer (as shown in FIG. 8, for instance) [as per claim 2]; wherein the dusting layer comprises a material having a body-centered-cubic crystallographic structure or a CsCl-type crystallographic structure (line 31 in column 7, for instance, i.e., "Cr" has a body-centered-cubic crystallographic structure, see lines 51-52 in column 2, for instance) [as per claim 6]; wherein the dusting layer comprises a material having a melting temperature above a melting temperature of the underlayer (lines 31-33 in column 7, for instance, i.e., Cr has a melting temperature above NiAl) [as per claim 9]; wherein the dusting layer comprises a material having a melting temperature above 1800 degrees Celsius (line 31 in column 7, for instance, i.e., Cr has a melting temperature above 1800 degrees Celsius) [as per claim 10]; and wherein the dusting layer has a thickness less than approximately 10 Angstroms (lines 34-35 in column 7, for instance, "10 Å" falls within the range of less than approximately 10 Angstroms in as broad as the term "approximately" may be construed) [as per claim 11].

8. Claims 1-5, 9-10, 27 and 29-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Sin et al. (US 6,353,318).

Sin et al. (US 6,353,318) teaches a magnetoresistive read head (100) comprising a magnetoresistive sensor (110); and a bias structure (includes 146, for instance) adjacent to the magnetoresistive sensor, the bias structure providing a magnetostatic bias field for the magnetoresistive sensor, the bias structure comprising an underlayer (142); a bias layer (146) over the underlayer; and at least one dusting layer (130) directly below at least one of the underlayer or the bias layer (as shown in Figure 2, for instance, i.e., directly below the underlayer) [as per claim 1]; wherein the dusting layer is directly below the underlayer (as shown in Figure 2, for instance) [as per claim 2]; wherein the dusting layer comprises discontinuous, densely-packed, small islands of material (as shown in Figure 2, for instance, i.e., two discontinuous, densely-packed, small islands of material are to the left and right of the magnetoresistive sensor, for instance) [as per claim 3]; wherein the dusting layer comprises a material having a sufficiently high surface energy and sufficiently low atomic mobility to form the islands (as shown in Figure 2, for instance) [as per claim 4]; wherein the dusting layer is formed (as shown in Figure 2, for instance) [as per claim 5]; wherein the dusting layer comprises a material having a melting temperature above a melting temperature of the underlayer (lines 7-8 and 36-37 in column 6, for instance, i.e., "Al_2O_3," for instance, has a melting temperature above a melting temperature of "Cr", for instance) [as per claim 9]; wherein the dusting layer comprises a material having a melting temperature above 1800 degrees Celsius (lines 7-8 in column 6, for instance, i.e., "Al_2O_3," for instance, has a melting temperature above 1800 degrees Celsius) [as per claim 10]; wherein the magnetoresistive sensor is selected from a group consisting of a giant magnetoresistive

(GMR) sensor, an anisotropic magnetoresistive (AMR) sensor, a tunneling magnetoresistive (TMR) sensor, a spin-dependent-tunneling (SDT) sensor, a spin valve (SV) sensor, a current-in-plane (CIP) sensor, and a current-perpendicular-to-the-plane (CPP) sensor (lines 11-14 in column 2, for instance, i.e., a group consisting of a giant magnetoresistive (GMR) sensor, a spin-dependent-tunneling (SDT) sensor, and a current-perpendicular-to-the-plane (CPP) sensor, for instance) [as per claim 27]; wherein the underlayer comprises a material selected from a group consisting of chromium, chromium-containing alloy, tungsten, tungsten-containing alloy, nickel-aluminum alloy, and iron-aluminum alloy (lines 36-39 in column 6, for instance, i.e., a group consisting of chromium, chromium-containing alloy, and nickel-aluminum alloy, for instance) [as per claim 29]; wherein the chromium-containing alloy comprises a material selected from a group consisting of titanium, vanadium, molybdenum, manganese, and tungsten (as the claims only set forth a situation when the underlayer material is chromium-containing alloy, and the present situation does not necessarily include chromium-containing alloy, the material composition of the chromium-containing alloy has no weight, see also paragraph 5, supra) [as per claim 30]; wherein the tungsten-containing alloy comprises a material selected from a group consisting of chromium, titanium, vanadium, and molybdenum (as the claims only set forth a situation when the underlayer material is tungsten-containing alloy, and the present situation does not include tungsten-containing alloy, the material composition of the tungsten-containing alloy has no weight, see also paragraph 5, supra) [as per claim 31]; wherein

the underlayer has a thickness in a range from approximately 20 Angstroms to approximately 250 Angstroms (lines 39-40 in column 6, for instance, i.e., "between 50 Å-100 Å" includes values within the range from approximately 20 Angstroms to approximately 250 Angstroms) [as per claim 32]; wherein the underlayer has a thickness in a range from approximately 70 Angstroms to approximately 200 Angstroms (lines 39-40 in column 6, for instance, i.e., "between 50 Å-100 Å" includes values within the range from approximately 70 Angstroms to approximately 200 Angstroms) [as per claim 33]; and wherein the bias layer comprises a material selected from a group consisting of CoPt, CoCrPt, CoCrPtTa, CoCrPtB, CrPt, and FePt (lines 54-57 in column 6, for instance, i.e., a group consisting of "CoPt," "CoCrPt," and "CoCrPtTa," for instance) [as per claim 34]. As the claims are directed to a "magnetoresistive read head", per se, the method limitation(s) appearing in line 2 of claim 5 can only be accorded weight to the extent that it affects the structure of the completed magnetoresistive read head. Note that "[d]etermination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process [i.e., "formed by ion-beam deposition", for instance], and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior product was made by a different process." See *In re Thorpe, et al.*, supra. Furthermore, note that a "[p]roduct-by-process claim, although reciting subject matter of claim in terms of how it is made [i.e., "formed by ion-beam deposition", for instance], is still product claim; it is patentability of product claimed and not recited

process steps that must be established, in spite of fact that claim may recite only process limitations." See *In re Hirao and Sato*, supra.

9. Claims 1-2 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ravipati et al. (US 5,434,826).

Ravipati et al. (US 5,434,826) teaches a magnetoresistive read head comprising a magnetoresistive sensor (includes 74, for instance); and a bias structure (includes 80A, for instance) adjacent to the magnetoresistive sensor, the bias structure providing a magnetostatic bias field for the magnetoresistive sensor, the bias structure comprising an underlayer (80B); a bias layer (80A) over the underlayer; and at least one dusting layer (88) directly below at least one of the underlayer or the bias layer (as shown in FIG. 6, for instance, i.e., directly below the underlayer) [as per claim 1]; wherein the dusting layer is directly below the underlayer (as shown in FIG. 6, for instance) [as per claim 2]; wherein the dusting layer has a thickness less than approximately 10 Angstroms (lines 38-39 in column 7, for instance, i.e., "from 0-100 Angstroms" includes values within the range less than approximately 10 Angstroms) [as per claim 11]; wherein the dusting layer has a thickness in a range from approximately 2 Angstroms to approximately 6 Angstroms (lines 38-39 in column 7, for instance, i.e., "from 0-100 Angstroms" includes values within the range from approximately 2 Angstroms to approximately 6 Angstroms) [as per claim 12]; and wherein the dusting, layer has a thickness of approximately 3 Angstroms (lines 38-39 in column 7, for instance, i.e.,

"from 0-100 Angstroms" includes values within the range of approximately 3 Angstroms) [as per claim 13].

10. Claims 1-2 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Ooshima et al. (US 2003/0030947).

Ooshima et al. (US 2003/0030947) teaches a magnetoresistive read head comprising a magnetoresistive sensor (includes 27, for instance); and a bias structure (includes 34, for instance) adjacent to the magnetoresistive sensor, the bias structure providing a magnetostatic bias field for the magnetoresistive sensor, the bias structure comprising an underlayer (24); a bias layer (34) over the underlayer (as shown in FIG. 20, for instance); and at least one dusting layer (23) directly below at least one of the underlayer or the bias layer (as shown in FIG. 20, for instance, i.e., directly below the underlayer) [as per claim 1]; wherein the dusting layer is directly below the underlayer (as shown in FIG. 20, for instance) [as per claim 2]; wherein the dusting layer has a thickness less than approximately 10 Angstroms (lines 1-2 of paragraph [0153] on page 10, for instance, i.e., "more than 0 Å and 50Å or less" includes values within the range less than approximately 10 Angstroms) [as per claim 11]; wherein the dusting layer has a thickness in a range from approximately 2 Angstroms to approximately 6 Angstroms (lines 1-2 of paragraph [0153] on page 10, for instance, i.e., "more than 0 Å and 50Å or less" includes values within the range from approximately 2 Angstroms to approximately 6 Angstroms) [as per claim 12]; and wherein the dusting, layer has a thickness of approximately 3 Angstroms (lines 1-2 of paragraph [0153] on page 10, for instance, i.e.,

"more than 0 Å and 50Å or less" includes values within the range of approximately 3 Angstroms) [as per claim 13].

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simion et al. (US 6,185,081).

Simion et al. (US 6,185,081) teaches the magnetoresistive read head as detailed in paragraph 7, supra, further wherein the magnetoresistive sensor is located over an aluminum oxide layer (25, lines 14-15 in column 4, for instance) on a substrate (lines 8-9 in column 4, for instance). Simion et al. (US 6,185,081), however, remains silent as to the substrate material being "silicon".

Official notice is taken of the fact that silicon is a notoriously old and well known substrate material in the art. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the substrate material of Simion et al. (US 6,185,081) be silicon. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the substrate material of Simion et al. (US 6,185,081) be silicon since such is a notoriously old and well known substrate material in the art, and since selecting a known material on the basis of its suitability for the intended use is within the level of ordinary skill in the art, *In re Leshin*, 125 USPQ 416 (CCPA 1960).

Pertinent Prior Art

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Larson et al. (US 2002/0186516) and Pinarbasi et al. (US 2003/0058586), which each individually teaches a magnetoresistive read head comprising a magnetoresistive sensor and a bias structure adjacent to the magnetoresistive sensor, the bias structure comprising an underlayer, a bias layer over the underlayer, and at least one dusting layer directly below at least one of the underlayer or the bias layer.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Craig A. Renner
Primary Examiner
Art Unit 2627

CAR